

WHAT IS CLAIMED IS:

1. An impact jar, comprising:
an impactor having a first down-hole tool connector;
an impactee slidably coupled to the impactor, having a second down-hole tool connector distal from the first down-hole tool connector, and having a plurality of flexible coupling fingers;
and
a biasable member detachably engaged by the plurality of flexible coupling fingers in a pre-impact position and configured to disengage the plurality of flexible coupling fingers in response to a tensile force applied across the first and second down-hole tool connectors reaching a predetermined quantity, wherein the impactor and impactee are configured to impact in response to the disengagement of the biasable member and the plurality of flexible coupling fingers.
2. The impact jar of claim 1 wherein the impactor includes a first aperture, the impactee includes a second aperture and the biasable member includes a third aperture, wherein the first, second and third apertures collectively form a continuous passage between the first and second down-hole tool connectors.
3. The impact jar of claim 1 wherein at least one of the first and second down-hole tool connectors are detachably couplable to a slick-line working string.
4. The impact jar of claim 1 wherein at least one of the first and second down-hole tool connectors are detachably couplable to an e-line working string.
5. The impact jar of claim 4 wherein at least one of the first and second down-hole tool connectors are also detachably couplable to a slick-line working string.
6. The impact jar of claim 1 wherein at least one of the first and second down-hole tool connectors are detachably couplable to a coiled tubing working string.

7. The impact jar of claim 1 wherein at least one of the first and second down-hole tool connectors are detachably couplable to a snubbing working string.

8. The impact jar of claim 1 wherein the impactee includes a standard fishing neck interface.

9. The impact jar of claim 8 wherein the fishing neck interface includes a beveled upstream edge.

10. The impact jar of claim 1 further comprising a latch and release sleeve slidably contained in the impactor, the latch and release sleeve restricting the disengagement of the plurality of flexible coupling fingers by the biasable member in the pre-impact position and configured to allow the disengagement in response to the tensile force reaching the predetermined quantity.

11. The impact jar of claim 1 further comprising an externally accessible adjustor configured to adjust the predetermined quantity.

12. The impact jar of claim 11 wherein the adjustor is configured to adjust the predetermined quantity without disassembly of the impact jar.

13. The impact jar of claim 11 wherein the adjustor is configured to adjust the predetermined quantity without disengaging either of the first and second down-hole tool connectors.

14. The impact jar of claim 11 wherein the adjustor is configured to adjust the predetermined quantity when the tensile force is between 0 pounds and the predetermined quantity.

15. The impact jar of claim 11 wherein the adjustor includes a threaded member axially translatable within the impactor in response to rotation relative to the impactor.

16. The impact jar of claim 15 wherein the impactor includes an adjustment window and the adjustor includes a tool interface configured to receive a tool through the adjustment window, whereby the adjustor is configurable in response to motion of the tool within the adjustment window.

17. The impact jar of claim 16 further comprising an adjustment window cover configured to selectively cover and expose the adjustment window.

18. The impact jar of claim 1 further comprising an inspection window through which an engagement status of the plurality of flexible coupling fingers and the biasable member is visibly noticeable.

19. The impact jar of claim 1 wherein the biasable member and the plurality of flexible coupling fingers are configured to re-engage in response to reduction of the applied tensile force.

20. The impact jar of claim 1 wherein the impact jar includes an anti-rotation mechanism configured to prevent relative rotation between the first and second down-hole tool connectors.

21. The impact jar of claim 20 wherein the anti-rotation mechanism includes an axial slot in the impactor configured to receive an anti-rotation member.

22. The impact jar of claim 1 wherein the impactor comprises at least two impactor portions couplable by threaded fasteners, wherein at least one of the at least two impactor portions includes a wrench flat proximate the threaded fasteners.

23. The impact jar of claim 1 further comprising a locking clamp couplable to at least one of the impactee and the impactor when the impactee and the biasable member are not

engaged, the locking clamp further configured to prevent the impactee and the biasable member from becoming engaged.

24. The impact jar of claim 1 wherein the first and second down-hole tool connectors include at least one fluid/air connector.

25. The impact jar of claim 1 wherein a length of the impact jar is about 5 feet.

26. The impact jar of claim 1 wherein a weight of the impact jar is about 45 pounds.

27. The impact jar of claim 1 wherein a maximum outer diameter of the impact jar is selected from the group consisting of:

about 1 1/2";
about 1 9/16";
about 1 11/16";
about 1 3/4";
about 1 13/16"; and
about 3 3/8".

28. The impact jar of claim 1 wherein a maximum outer diameter of the impact jar is selected from the group consisting of:

about 1 1/4";
about 1 3/8";
about 2";
about 2 1/8";
about 2 1/4";
about 2 3/4";
about 3 1/8";
about 3 1/2";
about 3 3/4"; and
about 4".

29. The impact jar of claim 1 wherein the impactor, the impactee and the biasable member each comprise nitrided steel.

30. The impact jar of claim 1 wherein the predetermined quantity ranges between about 100 pounds and about 8000 pounds.

31. The impact jar of claim 1 wherein the predetermined quantity ranges between about 150 pounds and about 1400 pounds.

32. The impact jar of claim 1 wherein the biasable member and the plurality of flexible coupling fingers are configured to disengage within about 5 seconds of the tensile force reaching the predetermined quantity.

33. An impact jar for use in a cased well-bore, comprising:
first and second opposing cased well-bore tool connectors;
an impactor coupled to the first cased well-bore tool connector; and
an impactee slidably coupled to the impactor, the impactor and the impactee configured to impact when a tensile force applied across the first and second cased well-bore connectors reaches a field adjustable predetermined quantity.

34. The impact jar of claim 33 further comprising an adjustor disposed within the impactor and having a plurality apertures configured to receive an external tool through an adjustment window in the impactor for adjusting the predetermined quantity.

35. The impact jar of claim 33 further comprising a biasable member detachably engaged to the impactee in a pre-impact position and configured to disengage the impactee in response to the tensile force reaching the predetermined quantity, thereby allowing the impactor and impactee impact.

36. A method of dislodging down-hole equipment from a well-bore, comprising:

coupling an impact jar to the down-hole equipment, the impact jar including:

an impactor coupled to a tensioning device;

an impactee slidably coupled to the impactor and coupled to the down-hole equipment; and

a biasable member detachably engaged to the impactee in a pre-impact position and configured to disengage the impactee in response to a tensile force applied by the tensioning device reaching a predetermined quantity, wherein the impactor and impactee are configured to impact in response to the disengagement of the biasable member and the impactee;

operating the tensioning device to increase the tensile force towards the predetermined quantity; and

reducing the tensile force applied by the tensioning device after the biasable member and the impactee disengage.

37. The method of claim 36 wherein reducing the tensile force applied by the tensioning device allows the biasable member and the impactee to re-engage.

38. The method of claim 36 further comprising alternately repeating until the down-hole equipment is dislodged:

(1) operating the tensioning device to increase the tensile force to cause the biasable member and the impactee to disengage; and

(2) reducing the tensile force to allow the biasable member and the impactee to re-engage.

39. The method of claim 38 wherein a time period between each impulse imparted to the down-hole equipment in response to the disengagement of the biasable member and the impactee ranges between about 0.5 seconds and about 5.0 seconds.

40. The method of claim 38 wherein the tensioning device includes a slick-line working string.

41. The method of claim 38 wherein the tensioning device includes an e-line working string.

42. The method of claim 38 wherein the tensioning device includes a coiled tubing working string.

43. The method of claim 38 wherein the tensioning device includes a snubbing working string.

44. The method of claim 36 wherein the impact jar is coupled to the down-hole equipment before the down-hole equipment is placed in the well-bore.

45. The method of claim 36 wherein the impact jar is coupled to the down-hole equipment after the down-hole equipment is placed in the well-bore.

46. The method of claim 36 further comprising adjusting the predetermined quantity.

47. The method of claim 46 wherein the biasable member includes a spring element and the impact jar further includes an adjustor against which one end of the spring element is biased, wherein adjusting the predetermined quantity includes rotating the adjustor relative to the impactor to cause the adjustor to translate axially relative to the impactor, thereby compressing the spring element.

48. The method of claim 47 wherein the adjustor is externally accessible.

49. The method of claim 46 wherein adjusting the predetermined quantity is performed without dismantling the impact jar.

50. The method of claim 46 wherein adjusting the predetermined quantity is performed without disassembling the impact jar from the down-hole equipment or the tensioning device.

51. The method of claim 46 wherein adjusting the predetermined quantity is performed while the impact jar is axially loaded by the weight of the down-hole equipment.

52. The method of claim 51 wherein the weight of the down-hole equipment is at least about 50 pounds.

53. A wellbore system, comprising:
a working string assembly including first and second portions;
a tensioning device configured to apply an adjustable tensile force to the working string;
and
an impact jar, including:
an impactor coupled to the first working string assembly portion;
an impactee coupled to the second working string assembly portion, slidably coupled to the impactor, and having a plurality of flexible coupling fingers; and
a biasable member detachably engaged to the plurality of flexible coupling fingers in a pre-impact position and configured to disengage the plurality of flexible coupling fingers in response to a tensile force applied by the tensioning device reaching a predetermined quantity, wherein the impactor and impactee are configured to impact in response to the disengagement of the biasable member and the plurality of flexible coupling fingers.

54. The system of claim 53 wherein the tensioning device includes a slick-line working string.

55. The system of claim 53 wherein the tensioning device includes an e-line working string.

56. The system of claim 53 wherein the tensioning device includes a coiled tubing working string.

57. The system of claim 53 wherein the tensioning device includes a snubbing working string.